



Serial Number: 09/893,036 Filing Date: June 27, 2001

Title: FLEXIBLE TAPE ELECTRONICS PACKAGING

Assignee: Intel Corporation

IN THE SPECIFICATION

Please make the paragraph substitutions indicated below. The specific changes incorporated in the substitute paragraphs are shown in the following marked-up versions of the original paragraphs.

The paragraph beginning on page 7, line 18 is amended as follows:

In FIG. 3, die 110 comprises a plurality of electronic circuits and signal conductors (not shown) that terminate in lands (not shown) arranged in several rows near the periphery 114 of the bottom surface of die 110 (as viewed in FIG. 3, with die 110 in a flip-chip orientation). Die 110 also comprises a plurality of power and ground conductors (not shown) that terminate in lands (not shown) within the central core region 115 of die 110. The signal and power lands on the lower surface of die 110 can be coupled to corresponding lands, pads, or signal nodes (not shown) on substrate 120 by appropriate connections such as solder bumps or solder balls 112 and 113, respectively. That is, viewing both FIGS. 3 and 4 (to be discussed below), signal lands around the periphery 114 of the bottom surface of die 110 can be coupled to corresponding signal lands 124 around the periphery 134 of a "conductor region" (as such term is defined further below) on the upper surface of substrate 120, and power and ground lands within the central core region 115 of the bottom surface of die 110 can be coupled to corresponding power and ground lands 129 within the central core region 135 of the "conductor region" on the upper surface of substrate 120.

The paragraph beginning on page 7, line 26 is amended as follows:

Flexible substrate 120, in the embodiment shown in FIG. 3, comprises three layers 121-123. In an embodiment, layers 121-123 are contiguous continguous, i.e. physically touching. Substrate 120, including layers 121-123, can be formed of a thin, flexible, electrically insulating tape or film. Such films are well known in the tape automated bonding (TAB) art. Such films can be formed of various materials. For example, they can be formed of polymeric films, such as polyimide. Other possible materials include polyester, polyparabanic acid, epoxy, and fiberglass.

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AMENDMENT AND RESPONSE UNDER 37 CFR § 1.111

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The paragraph beginning on page 8, line 8 is amended as follows:

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Upper layer 123 has formed directly on its upper surface a plurality of <u>signal</u> terminals or lands 124 <u>and power and ground lands 129</u> to couple with corresponding pads of IC 110 through <u>signal</u> bumps 112 <u>and power and ground bumps 113, respectively</u>. Other lands 127 can also be formed on the upper surface of upper layer 123. Lands 127 can be used to couple to corresponding terminals 132 on the upper surface of PCB 130 through wire leads such as lead 140.

The paragraph beginning on page 8, line 20 is amended as follows:

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Conductive vias, such as vias 126, can be formed in any layer 121-123, through a subset of layers 121-123, or through all three layers 121-123, to couple traces within different layers 126, or to couple lands such as 124, 127, and 128, and 129 to internal traces such as traces 125 and 131.

The paragraph beginning on page 9, line 27 is amended as follows:

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The top-view of flexible tape package assembly 100 shown in portion A includes the top of IC 110 as mounted upon flexible tape package substrate 120 by way of, for example, a surface mount technique, such as a BGA pattern that can include <u>signal</u> lands 124 (shown in dashed lines in portion A, since they are underneath IC 110). <u>Signal lands 124 are located around the periphery 134 of the "conductor region" (as defined below).</u>

The paragraph beginning on page 10, line 12 is amended as follows:

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The top-view of flexible tape package assembly 100 shown in portion B includes the top of flexible tape package substrate 120, showing a BGA pattern on its upper surface, which includes power and ground lands 129 124. Power and ground lands 129 are located within a central core region 135 of the "conductor region" (as defined below).